Printed-Wiring Board Supplier Audit Checklist

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ABSTRACT: This audit procedure is used by the Digital Qualification Team to gather information for qualification of a potential printed-wiring board supplier.

APPLICABILITY: This audit procedure supports the qualification procedure specified by DEC STD 088-0 Qualification Procedure for All Printed-Wiring Board Suppliers.

STATUS: APPROVED 04-Dec-1992; use VTX SMC for current status.

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APPROVAL: This document has been reviewed and recommended for approval by the General Review group for its category.

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1 INTRODUCTION

This document provides a uniform procedure for evaluating a printed-wiring board (PWB) supplier's capability to control product and process quality to established criteria. All approved manufacturing operations shall comply with this audit criteria.

The supplier's ISO 9000 certification status may be used to determine the level of audit required. If a supplier is not ISO 9000 certified, then the entire audit must be performed. If a supplier is ISO 9000 certified and has provided proof of certification status, then only items on the following list need to be performed. However, the Digital audit team reserves the right to perform a complete or partial audit of the elements listed in the list when deemed necessary.

NOTE

To obtain requirements of the ISO 9000 certification, refer to *DEC STD 017-0 Quality Assurance System Requirements*.

Head or Subhead	Title
4.5	Reliability
7	PRODUCTION INSPECTION AND FINAL AUDIT
8	TOOLING INSPECTION, HANDLING, AND STORAGE
9	ELECTRICAL TEST AND REPAIR
10	IMPEDANCE TESTING
11	ENGINEERING CHANGE ORDER (ECO) CONTROL
17.1	Statistical Process Control (SPC)
18	WET AND DRY LAB PROCEDURES
19	WASTE TREATMENT SYSTEM
21	MATERIAL IDENTIFICATION, TRACEABILITY OF ITEMS, AND STAMP CONTROL
27	PRODUCT SAFETY
28	EMPLOYEE SAFETY PRACTICES

2 PROCEDURE FOR PERFORMING THE EVALUATION AND COMPLETING THE CHECKLIST

The following items outline the procedure for performing the evaluation and completing the checklist.

- The audit procedure shall be given to the supplier in advance of the audit. The audit team leader explains the purpose of the procedure to be used in conducting the evaluation and works closely with the supplier's audit leader in preparation for the audit.
- The supplier is requested to provide copies of all pertinent information used to control the operation, with the exception of propriety information (documentation, forms, and reports) to the Digital Quality Organization at least two weeks in advance of the audit date.
- It is recommended that both audit leaders draw up a schedule for the audit, indicating section, time schedule, and auditor and auditee. This schedule shall be made available to all persons participating in the audit.

- Deviations from the time schedule may be required to ensure a thorough audit; however, the audit team and supplier are encouraged to remain on schedule whenever possible.
- The supplier can facilitate keeping on schedule by ensuring that all persons to be audited are prepared for the audit and except for emergency situations make themselves available for audit.
- All sections of the audit checklist (Section 3 though Section 28 of this document) shall be completed by the individual assigned to perform the audit. A checkmark shall be used whenever a *Yes, No,* or *N/A* (not applicable) answer appears to the left of a question. Where a qualified answer is necessary due to partial compliance, the question shall be answered *No* and an explanation for the *No* given in the Comments section. A separate sheet of notes may also be attached, if needed.
- If a supplier has more than one business or facility, a separate checklist shall be completed for each business or facility.
- It is recommended that the auditor be accompanied by a representative of the supplier's quality assurance group during all phases of the evaluation.
- Upon completion of the evaluation, the preliminary results shall be presented to the supplier's management. The intent is to initiate a cooperative effort in identifying, setting priorities, and correcting discrepancies.
- The final written report shall be presented to the Digital Area Qualification Office within two weeks of the audit and shall be a completed checklist indicating results, enhancements, comments, and corrective actions. Distribution of the final report shall be limited to those people who can contribute to the solution of identified problem areas and provide supplier-management directives.
- The supplier is expected to formulate a plan and time schedule for completing corrective actions. The plan shall be made available to the Digital Quality Organization.

The evaluation procedure follows.

1. Preliminary evaluations shall be made immediately following the audit; however, they are subject to change during the audit team final evaluation review.

   Evaluations represent the auditor's best judgment after all evidence has been considered. Evidence shall include, as applicable: written documentation review; verbal review if the document is not available or applicable; date, file, and record analysis; system and operation observations; and discussions with personnel, management, supervisors, operators, and inspectors.
2. The audit team shall meet, as soon as possible after the audit, to review and discuss findings and to generate a final audit report. The audit report shall detail the team findings, corrective actions, and final evaluations.
3. The audit report shall be presented to supplier management and groups audited.
4. The audit report shall include all Action Item Report forms (shown in Figure 1), to be completed by the audit team leader. The supplier shall fill in the *responsible person* and *planned completion date* boxes within one week of receiving the form.

5. The following evaluation criteria are used in the PWB Audit Evaluation Summary shown in Figure 2. The rating should be entered after completing the summary.

Rating	Criteria
1	System is in place; meets all criteria
2	System is in place; needs at least one action
3	System missing; requires development

NOTE

Recommendations for items that do not require an action item, but could be enhanced, shall be noted in the *Comments* section of each audit category.

Figure 1: PWB Supplier Audit Action Item Report

PWB SUPPLIER AUDIT
ACTION ITEM REPORT

Supplier _____

Date _____

Page _____ of _____

Responsible Person Planned Completion Date Date Completed	SECTION : ACTION ITEM (S) :
Responsible Person Planned Completion Date Date Completed	SECTION : ACTION ITEM (S) :
Responsible Person Planned Completion Date Date Completed	SECTION : ACTION ITEM (S) :

Figure 2: PWB Audit Evaluation Summary

Company _____ Evaluation Date _____

Address _____

QUALITY SYSTEM EVALUATED

1	Introduction	
2	Procedure for Performing the Evaluation and Completing the Checklist	
3	General Supplier Information	
4	Quality and Reliability Program	1 ....2 3
5	Inspection and Test Plan	1 ....2 3
6	Receiving/Incoming Inspection Ship–to–Stock	1 ....2 3
7	Product Inspection and Final Audit	1 ....2 3
8	Tooling Inspection, Handling, and Storing	1 ....2 3
9	Electrical Test and Repair	1 ....2 3
10	Impedance Test	1 ....2 3
11	Engineering Change Order (ECO) Control	1 ....2 3
12	Quality Records	1 ....2 3
13	Nonconforming Material (NCM) Control	1 ....2 3
14	Returned Material (from customer)	1 ....2 3
15	Corrective Action	1 ....2 3
16	Internal Audits	1 ....2 3
17	Process Controls	1 ....2 3
18	Wet and Dry Lab Procedures	1 ....2 3
19	Waste Treatment System	1 ....2 3
20	Manufacturing Process Documentation	1 ....2 3
21	Material Identification, Traceability of items, Stamp Control	1 ....2 3
22	Material Handling and Storage, Stockroom Control	1 ....2 3
23	Packaging and Shipping	1 ....2 3
24	Calibration Control and Maintenance	1 ....2 3
25	Purchasing	1 ....2 3
26	Skills Training and Qualification	1 ....2 3
27	Product Safety	1 ....2 3
28	Employee Safety Practices	1 ....2 3

3 GENERAL SUPPLIER INFORMATION

Supplier:

Address:

Date(s) of visit:

Approximate population of plant:

Number of shifts in operation:

Type of audit (initial, annual, follow-up, or fact-finding audit unrelated to qualification):

Audit Team Members location:

Supplier Management:

Quality Manager _____

Plant Manager _____

Business Manager _____

Manufacturing Engineering Manager _____

Material Manager _____

Production Manager _____

Training manager _____

4 QUALITY AND RELIABILITY PROGRAM

This is a questionaire for quality and reliability.

4.1 ORGANIZATION FOR QUALITY ASSURANCE

	Yes	No	N/A	
				Does Quality Assurance have responsibility for ensuring:
1.	___	___	___	In-process inspection?
2.	___	___	___	Incoming inspection?
3.	___	___	___	Final inspection or audit?
4.	___	___	___	Verification of supplier quality performance?
5.	___	___	___	Process Capability studies?
6.	___	___	___	Quality program development and implementation?
7.	___	___	___	Product life tests?
8.	___	___	___	On-going reliability testing?
9.	___	___	___	Closure of corrective actions?
10.	___	___	___	Quality assurance of work in-process?
11.	___	___	___	User's audits (trained by Digital)?
12.	___	___	___	Identifying quality problems?
13.	___	___	___	Preventing further processing of nonconformances?
14.	___	___	___	Preventing shipment of nonconforming product?
				Does Quality Assurance participate in:
15.	___	___	___	Manufacturing planning?
16.	___	___	___	Design reviews?
17.	___	___	___	Material review boards (MRB)?
18.	___	___	___	Or providing input to operator proficiency reviews?

Comments:

4.2 QUALITY PLAN

	Yes	No	N/A	
1.	___	___	___	Is a current quality program plan documented and under revision control?
2.	___	___	___	Has the quality plan been approved and signed?
3.	___	___	___	Is there a functional organization chart indicating reporting structure and total areas of responsibility for all functions within the business field?
4.	___	___	___	Is the plan reviewed at least once a year?
5.	___	___	___	Does the quality plan reference a complete manufacturing process flowchart?
6.	___	___	___	Does the flowchart indicate the location of all process control, inspection, test, and audit points in the process?
7.	___	___	___	Is each point on the flowchart referenced by applicable process documentation procedure numbers?
8.	___	___	___	Does the flowchart accurately reflect current process steps?
9.	___	___	___	Is reference documentation, including Digital standards and engineering specifications, current and available?
10.	___	___	___	Contain a product reliability section?
11.	___	___	___	Contain a product safety section?
12.	___	___	___	Require quality performance measurement and reporting?
13.	___	___	___	Require a closed-loop corrective action process?
14.	___	___	___	Define a policy for nonconforming material?

Comments:

4.3 QUALITY MANUALS AND POLICIES

	Yes	No	N/A	
1.	___	___	___	Is a documented quality control manual or quality policy procedure used?
2.	___	___	___	Are the manuals updated with present operating procedures?
3.	___	___	___	Are the manuals subject to established periodic reviews?
4.	___	___	___	Are revisions or changes under ECO control?
5.	___	___	___	Is there a distribution list of manual holders for updates to the manual?

Comments:

4.4 QUALITY ASSURANCE

How is product quality assured:

A. Final inspection?
100%?
Sample lot?

B. In-process inspection?
100%
Sample lot?

C. Process control?
Statistical process control?
How?

If statistical process control is not used, explain how the process quality performance is predicted.

Are there continuous improvement programs implemented?

Is failure analysis performed?
On process nonconformance?
On customer returns?

How is quality performance measured and reported?

4.5 RELIABILITY (INFORMATION ONLY)

	Yes	No	N/A	
1.	___	___	___	Is there an ongoing reliability test plan?
2.	___	___	___	Is testing designed to induce failures?
3.	___	___	___	Does the plan include a closed-loop feedback system after determining failure mechanisms?
4.	___	___	___	Have reliability goals been set and documented?
5.	___	___	___	Does the reliability plan verify conformance to the minimum requirements of *DEC STD 176-0 Printed-Wiring Board Acceptance Criteria* and applicable project specifications and requirements?
6.	___	___	___	Does the reliability plan include environmental stress screening (temperature /humidity cycling)?

Comments:

5 INSPECTION AND TEST PLAN

	Yes	No	N/A	
1.	___	___	___	Is there a plan for inspecting and testing products?
2.	___	___	___	Is the plan documented and under revision control?
3.	___	___	___	Is the plan followed, kept current, and on location?
				Does the inspection and test plan include, as a minimum:
4.	___	___	___	Each inspection and test point, including location?
5.	___	___	___	Characteristics to be inspected?
6.	___	___	___	Acceptance criteria?
7.	___	___	___	Sampling plans, if applicable?
8.	___	___	___	Is there evidence that items are being inspected and tested as planned?
9.	___	___	___	Are checklists used to verify completion of inspection and test operations?

Comments:

6 RECEIVING AND INCOMING INSPECTION SHIP-TO-STOCK

	Yes	No	N/A	
				Is there a written, approved procedure that is revision controlled and on location for Receiving that:
1.	___	___	___	Includes a flowchart describing how raw material is processed to stockroom?
2.	___	___	___	Defines the process for identifying and logging in materials?
3.	___	___	___	Defines the process for handling and reporting damaged material?
4.	___	___	___	Is there evidence that Receiving complies with these procedures?
5.	___	___	___	Are incoming inspection procedures documented and approved?
6.	___	___	___	Is there a method for ensuring that the proper (revision) material is received and processed through incoming inspection?
7.	___	___	___	Is there a system for traceability that guarantees the ability to recall all nonconforming material or products?
				Does Incoming Inspection monitor the quality of:
8.	___	___	___	Raw materials?
9.	___	___	___	Mass Lam, if applicable?
10.	___	___	___	Chemicals?
11.	___	___	___	Drills?
12.	___	___	___	Is there a complete and current set of purchase specifications (including UL requirements) and engineering documentation maintained and used as the criteria for acceptance?
13.	___	___	___	Is supplier performance trend data being reported, recorded, and analyzed?
14.	___	___	___	Are sampling plans used in accordance with *MIL STD 105D, Single Sampling, Normal at an AQL of 0.65%*, or an alternate plan that has been properly approved and documented?
15.	___	___	___	Is supplier performance history reviewed periodically with appropriate follow-up?
16.	___	___	___	For all material that is not inspected during incoming inspection, do alternative means exist for ensuring the integrity and quality of these parts and subassemblies?
17.	___	___	___	Is there appropriate segregation provided for raw material, nonconforming material, and material pending inspection or test?
				Is there a system that ensures agreement between Incoming Inspection, Manufacturing Engineering, Quality Control, and customers on:
18.	___	___	___	Any modification to basic test or inspection characteristics?
19.	___	___	___	Any re-evaluation of sampling plans for cost and risk?
20.	___	___	___	The potential impact on product quality of material waivers before implementation?
21.	___	___	___	Are reports issued by Incoming Inspection highlighting problem parts and corrective action?
22.	___	___	___	Are incoming inspection records complete and readily available?
23.	___	___	___	Does a random sample of part numbers show that tests performed and sample plans used are those defined in the incoming inspection procedures?
24.	___	___	___	Are all test equipment and tools used to inspect material properly calibrated?
				Are the following records kept on file:
25.	___	___	___	Certificates of compliance?

26.	___	___	___	Flammability testing?
27.	___	___	___	Reasons for rejections and dispositions?
28.	___	___	___	Vendor Corrective Action Requests (VCARs)?

Comments:

7 PRODUCT INSPECTION AND FINAL AUDIT

	Yes	No	N/A	
1.	___	___	___	Are all product inspection and audits (in-process, final, and user) performed according to a documented and approved procedure that is revision controlled, current, and on location?
2.	___	___	___	Is DEC STD 176-0 used as a basis for inspecting Digital circuit boards?
3.	___	___	___	Are all applicable procedures and specifications readily available to persons involved with performing the inspection or audit?
4.	___	___	___	Are checklists used to verify completion of inspection and test operations?
5.	___	___	___	Are formal sampling plans used?
6.	___	___	___	Are first-time build parts subject to a sample build and first article analysis for verification of part specifications?
7.	___	___	___	Are adjustments made to build procedures, if required?
8.	___	___	___	Are changes verified by an additional sample build?
9.	___	___	___	Is lot status properly and clearly identified through a process control system, including process flow sheets and acceptance stamps?
10.	___	___	___	Are hold areas provided for items awaiting tests, Material Review Board (MRB), documentation, and so on?
11.	___	___	___	Are nonconforming items appropriately identified to differentiate from acceptable products?
12.	___	___	___	Is a final audit performed on all outgoing lots?
13.	___	___	___	Is the auditor trained by Digital and certified?
14.	___	___	___	Is there evidence that proper inspection criteria and sampling plans are used?
15.	___	___	___	Are all equipment and tools used for inspecting materials under proper calibration control?
16.	___	___	___	Is there a method to prevent uninspected PWBs from being shipped?
17.	___	___	___	Is a packaging inspection performed as part of product audit?
18.	___	___	___	Is rework conducted in accordance with documented procedures and subject to inspection and tests?
				Does the inspection operation inspect for:
19.	___	___	___	Inspection stamps (Electrical test, Hi-Pot and so forth?)

	Yes	No	N/A	
20.	___	___	___	Digital required markings (UL, part number, revision, and so forth?)
21.	___	___	___	Etched designations according to drawing and purchase order requirements?
22.	___	___	___	Dimensions and tolerances for length, width, warpage, slots, and so on?
23.	___	___	___	Surface and edge delamination?
24.	___	___	___	Finished conductor widths and condition of etch?
25.	___	___	___	Conductor and pad spacing?
26.	___	___	___	Contact finger beveling and plating?
27.	___	___	___	Condition of solder plating in holes and on surface?
28.	___	___	___	Finishing-hole size and condition?
29.	___	___	___	Plating thickness check for gold and nickel?
30.	___	___	___	Material thickness?
31.	___	___	___	Gold-finger visual check?
32.	___	___	___	Cosmetics?
33.	___	___	___	Soldermask cure, adhesion, abrasion?
34.	___	___	___	Solderability?
35.	___	___	___	Impedance, capacitance (as required?)
36.	___	___	___	Are cross-sections performed to determine plating thickness, condition, and hole wall characteristics?
37.	___	___	___	Is inspection frequency defined and adhered to?

Comments:

8 TOOLING INSPECTION, HANDLING, AND STORING

Here is a questionaire for tooling inspection, handling, and storing.

8.1 INCOMING INSPECTION TOOLING PACKAGES

	Yes	No	N/A	
1.	___	___	___	Is there a current, approved, written procedure that is revision controlled and on location that outlines requirements for inspection and control of tooling packages?
2.	___	___	___	Are all artwork, drill tapes, testheads, and tooling packages checked against job requirements before issue, particularly etch revision level?
3.	___	___	___	Is artwork checked for quality and registration prior to use?
4.	___	___	___	Does the supplier have a method to ensure dimensional accuracy of the artwork?
5.	___	___	___	Is artwork handled and stored to prevent damage from the environment, including dust, scratches, and dimensional changes from high temperatures and humidity (climate-controlled area)?
6.	___	___	___	Is an identification process in place for items awaiting tests, documentation, and corrective action?
7.	___	___	___	Is complete and current engineering documentation maintained and used as the criteria for acceptance?
8.	___	___	___	Is DEC STD 176-0 complete and current and used as the criteria for acceptance?
9.	___	___	___	Is a file of tooling-package, corrective-action requests and responses maintained and current?
10.	___	___	___	Are tools properly and clearly identified with acceptance and usability status through a control system, such as flow sheets or acceptance stamps?
11.	___	___	___	Are tools reinspected before being returned to the production floor?
12.	___	___	___	Are frequency or conditions for returns defined and adhered to?
13.	___	___	___	Are panel specifications and plant tooling defined on controlled drawings?

Comments:

8.2 HANDLING AND STORING TOOLING PACKAGES

	Yes	No	N/A	
				Is there a current, approved, written procedure that is revision controlled and on location that outlines the requirements for handling and storing:
1.	___	___	___	Artwork?
2.	___	___	___	Testheads and overlays?
3.	___	___	___	Verified (good) boards?
4.	___	___	___	Tapes?
5.	___	___	___	Prints?
6.	___	___	___	Are all items protected at all times to prevent damage from the environment or storage conditions?
7.	___	___	___	Are containers properly identified?
8.	___	___	___	Are part numbered items maintained at correct revision levels?
9.	___	___	___	Are proper material packaging and handling procedures in evidence?
10.	___	___	___	Are proper housekeeping procedures in evidence throughout the area?

Comments:

9 ELECTRICAL TEST AND REPAIR

Here is a questionaire for electrical test and repair.

9.1 ELECTRICAL TEST

	Yes	No	N/A	
1.	___	___	___	Is there a current, approved, and documented procedure under revision control and on location for testing boards?
2.	___	___	___	Is test coverage verified to be 100% all network end-points?
3.	___	___	___	Are boards tested for simultaneous test of Side 1 and Side 2 when endpoints do not terminate on the same side?
4.	___	___	___	Is there a revision letter on all testheads?
5.	___	___	___	Is data driven and test procedures utilized?
6..	___	___	___	Is a known good board used for programming the tester?
7.	___	___	___	Are testheads stored to prevent damage?
8.	___	___	___	Are boards tested after soldermask?
9.	___	___	___	Are first-piece boards examined for damage caused by testheads?
10.	___	___	___	Are good boards stamped immediately after test?
11.	___	___	___	Is stamp access controlled?
12.	___	___	___	Are bad boards segregated and identified?
13.	___	___	___	Are test-fault slips taped to boards?
14.	___	___	___	Is there evidence of a Hi-pot test stamp?
15.	___	___	___	Does the test meet all Hi-pot coverage and procedural coverage requirements as stated in DEC STD 176-0?
16.	___	___	___	Is test equipment routinely checked for performance? Is there evidence of this?
17.	___	___	___	Is preventive maintenance performed on a regular basis?
18.	___	___	___	Is there an approved, documented procedure that ensures a test probe point location is provided for the end-points of all continuous circuit paths?
19.	___	___	___	Is the procedure under revision control?
20.	___	___	___	Are end-point counts permanently identified on the testhead and initialed by the engineer?
21.	___	___	___	Is the lot put on hold if the tester does not correlate the correct number of end-points identified with each test head?
22.	___	___	___	Are test logs used to provide lot traceability?
23.	___	___	___	Are rejects recorded and accounted for in these logs?
24.	___	___	___	Is corrective action generated from these logs?
25.	___	___	___	Is there evidence that corrective actions have taken place and are current?

Comments:

9.2 REPAIR

	Yes	No	N/A	
1.	___	___	___	Is there a documented, approved procedure for repairing/reworking product?
2.	___	___	___	Is the product or procedure under revision control?
3.	___	___	___	Is the latest revision of *DEC STD 176-1 Printed-Wiring Board Repair Criteria* in the area and is it used to determine repair criteria?
4.	___	___	___	Are all repaired or reworked boards retested to verify that repairs were successfully completed?
5.	___	___	___	Are repaired or reworked boards marked differently from first pass boards (Information Only)?

Comments:

9.3 OTHER

1. Describe how tester-identified opens and shorts are traced and repaired.

2. List names and model numbers of test equipment used for test and repair of Digital products.

3a. List electrical test parameters used to test Digital products.

Voltage:
Amperage:
High and low resistance thresholds:

3b. List test parameters used to isolate and identify high and low resistance shorts.

Voltage:
Amperage:

10 IMPEDANCE TEST

	Yes	No	N/A	
1.	___	___	___	Is there a current, approved documented, and revision-controlled procedure on location that defines the method for impedance testing?
2.	___	___	___	Is the time domain reflectometer properly calibrated and under calibration control?
3.	___	___	___	Is a backup tester available for use?
4.	___	___	___	Is the time domain reflectometer checked for calibration before each use by means of calibration coupon or terminator?
5.	___	___	___	Are test coupons and boards serialized for traceability?
6.	___	___	___	Are impedance measurements made to customer requirements and properly documented with full traceability?
7.	___	___	___	Are measurements sent with the lot?
8.	___	___	___	Are nonconforming boards immediately labeled and segregated?

Comments:

11 ENGINEERING CHANGE ORDER (ECO) CONTROL

	Yes	No	N/A	
1.	___	___	___	Is there a group or person designated to be responsible for the coordination, control, and implementation of ECOs?
2.	___	___	___	Is there one complete master file of all pertinent documentation?
3.	___	___	___	Is it current with proper revision levels?
4.	___	___	___	Does final inspection verify product revision level against print or process sheets?

Comments:

12 QUALITY RECORDS

	Yes	No	N/A	
1.	___	___	___	Is there an approved, written, and revision-controlled procedure that is current, on location, and outlines the requirements for control and storage of quality records?
				Do quality records include, as a minimum:
2.	___	___	___	Procedures, processes, and items audited?
3.	___	___	___	Results obtained?
				Do records include, as a minimum:
4.	___	___	___	Build or commit documentation?
5.	___	___	___	Lab reports?
6.	___	___	___	Pertinent information required for tracing?
7.	___	___	___	Process sheets?
8.	___	___	___	In-process audit, test, and inspection results?
9.	___	___	___	Final inspection, documentation, and shiplists?
10.	___	___	___	Identification of items by reference drawing and revision number or part number?
11.	___	___	___	Specific inspection performed?
12.	___	___	___	Inspection results?
13.	___	___	___	Test results?
14.	___	___	___	Basis of acceptance?
15.	___	___	___	Nonconformance?
16.	___	___	___	Corrective action taken?
17.	___	___	___	Date of inspection or test?
18.	___	___	___	Inspector or date recorder?
19.	___	___	___	Is there an approved plant or business procedure that defines the documents and records to be retained?
20.	___	___	___	Is there a plan in place for long term or maximum security?
21.	___	___	___	Is there evidence that records stored both inside and outside the plant are retained and retrievable according to plan?

Comments:

13 NONCONFORMING MATERIAL (NCM) CONTROL

	Yes	No	N/A	
				Is there an approved, documented method of dispositioning nonconforming material resulting from:
1.	___	___	___	Incoming inspection?
2.	___	___	___	Interplant shipments?
3.	___	___	___	Work-in-process?
4.	___	___	___	Customer returns?
5.	___	___	___	Is all nonconforming material, regardless of origin, segregated and identified to prevent its use as acceptable material?
6.	___	___	___	Is a nonconforming material report/tag or transfer flow sheet used to document the status and disposition of nonconforming material?
7.	___	___	___	Is there a Material Review Board that includes representatives of Quality Control, Engineering, and Production that meets regularly?
8.	___	___	___	Do summary reports highlight quality trends, supplier problems, and scrap and rework costs?
9.	___	___	___	Are summary reports distributed to upper management?
				Is there evidence of a feedback and corrective action system for all nonconforming material:
10.	___	___	___	Supplied by suppliers and subcontractors?
11.	___	___	___	Resulting from in-process problems?
12.	___	___	___	Returned from customers?
13.	___	___	___	Does the process for disposing of scrap material prevent excessive stockpiling and encourage removal from the premises?

Comments:

14 RETURNED MATERIAL (FROM CUSTOMER)

	Yes	No	N/A	
				Is there a current, approved, and documented procedure that is under revision control that defines:
1.	___	___	___	The control of returns within the business?
2.	___	___	___	The process for receiving and handling returns?
3.	___	___	___	The method of identification at shipment?
4.	___	___	___	Are returns segregated and identified within the stockroom?
5.	___	___	___	Is there an effective system for handling, routing, retesting, and process control of returns?
6.	___	___	___	Do all repaired returns undergo a final quality control inspection and test before entry into the finished goods stockroom?
7.	___	___	___	Is there a Material Review Board that evaluates and dispositions returns?
				Do returns automatically generate internal corrective actions to:
8.	___	___	___	Production for process correction and defect prevention?
9.	___	___	___	Inspection or final audit to prevent acceptance of the defect?
10.	___	___	___	Does the company or facility document return activity for trend analysis?
11.	___	___	___	Are returns included in quality (yield) reports?
12.	___	___	___	Are these reports distributed to all plant and business management for review?

Comments:

15 CORRECTIVE ACTION

	Yes	No	N/A	
				Is there a current, documented, and approved corrective action system that addresses problems with:
1.	___	___	___	Process control data?
2.	___	___	___	In-process inspection results?
3.	___	___	___	Supplier corrective action activity?
4.	___	___	___	Nonconforming material activity?
5.	___	___	___	Customer feedback?
6.	___	___	___	Internal and supplier audits?
7.	___	___	___	Is there evidence that a closed-loop feedback system is in effect?
				Is there a corrective action team with assigned responsibilities for:
8.	___	___	___	Identifying and setting priorities for problems?
9.	___	___	___	Verifying that solutions are implemented?
10.	___	___	___	Documenting problems, solutions, commitments?
11.	___	___	___	Does the corrective action team have members from each discipline including Production, Engineering, Quality?
12.	___	___	___	Are there specific guidelines stating when corrective action requests should be issued?
13.	___	___	___	Are these guidelines followed?
14.	___	___	___	Are corrective action requests properly completed and maintained under a controlled system?
15.	___	___	___	Are there specific guidelines stating when corrective action occurs within the prescribed time intervals?
16.	___	___	___	Are there outstanding delinquent corrective actions?
17.	___	___	___	Is there a follow-up system in operation for overdue corrective action replies?
18.	___	___	___	Is there a report to higher management regarding open or delinquent corrective action replies?

Comments:

16 INTERNAL AUDITS

	Yes	No	N/A	
1.	___	___	___	Is there a current, approved internal audit procedure and checklist to assess company or facility compliance to the elements of the quality plan?
				Do audit procedures, checklists, and corrective action sheets exist for:
2.	___	___	___	Process audits?
3.	___	___	___	Product safety audits?
4.	___	___	___	Others (describe below)
				_____
				_____
				_____
				_____
				Do audit procedures define:
5.	___	___	___	Functional areas to be audited?
6.	___	___	___	Assignment of those performing audit?
7.	___	___	___	Frequency of audits?
8.	___	___	___	Methods of reporting findings and recommendations?
9.	___	___	___	Responsibility for and method of implementing corrective actions?
10.	___	___	___	Re-auditing of deficient areas and verification of closure?
11.	___	___	___	Records and files that shall be maintained?
12.	___	___	___	Is there evidence that audits are being performed according to the above procedures and at the specified frequency?
13.	___	___	___	Are audits conducted according to written procedures or checklists?
14.	___	___	___	Are audits performed by personnel not directly responsible for the area being audited?
15.	___	___	___	Does management review audit results?
16.	___	___	___	Is there evidence that corrective action is being effectively implemented on a timely basis?
17.	___	___	___	Are deficient areas being re-audited?
18.	___	___	___	Are supplier or subcontractors included in the auditing procedures and schedules?
19.	___	___	___	Are there written, approved procedures and schedules in use for auditing suppliers?
20.	___	___	___	Is there evidence that suppliers are regularly audited with corrective actions and re-audits performed as required?

Comments:

17 PROCESS CONTROLS

	Yes	No	N/A	
1.	___	___	___	Have process controls been established at all critical control points in the process (copper plating, image, drill, and lamination)?
				Do instructions clearly specify:
2.	___	___	___	Data to be collected?
3.	___	___	___	Responsible persons and the method used for filling out the charts?
4.	___	___	___	Time schedule for data collection?
5.	___	___	___	Is process control data prepared and distributed at a frequency that provides early indication of potential problems?
6.	___	___	___	Are rework stations used as sources of process control data and feedback for corrective actions?
7.	___	___	___	Is there an approved, documented corrective action system used by the team when process controls are not within prescribed limits?
8.	___	___	___	Are records of corrective action maintained by the team?
9.	___	___	___	Is there evidence that the process control system is effective as a tool for corrective action?
				If statistical process controls are used:

Comments:

17.1 STATISTICAL PROCESS CONTROLS (SPC)

Reference *IPC-PC-90 General Requirement for Implementation of Statistical Process Control.*

	Yes	No	N/A	
1.	___	___	___	Is there a documented SPC program?
2.	___	___	___	Is there a documented business philosophy statement on SPC?
3.	___	___	___	Is there a documented SPC training program for production people and first-line supervisors and evidence of its implementation?
4.	___	___	___	Is there a person(s) responsible for coordinating SPC implementation, application and utilization?
5.	___	___	___	Has management been trained in SPC?
6.	___	___	___	Are there routine formal management reviews of the SPC program?
7.	___	___	___	Where are SPC controls established? Please provide flow chart.
8.	___	___	___	Do control charts and logs have control limits that have been established statistically?
9.	___	___	___	Are control chart and log limits reviewed periodically and adjusted as necessary?
10.	___	___	___	Are clear instructions available and used for control chart maintenance?
11.	___	___	___	Have persons who are required to fill out control charts been trained in proper procedures for doing so?
12.	___	___	___	Are control charts or data distributed at specific intervals in accordance with an established distribution list that includes Key Quality Control, Engineering, and Production personnel?
13.	___	___	___	Are there process capability index goals for critical processes?
14.	___	___	___	Are there process capability index goals for critical end product parameters?
15.	___	___	___	Is there a designated team responsible for long-term process control chart data analysis and the implementation of necessary corrective action?
16.	___	___	___	Is there a statistician resource with advanced statistical application experience (for example, regression analysis, multiple experimental design techniques, and so forth?)
17.	___	___	___	Is there evidence of statistical control of measurement systems (for example, appropriate charts with control limits established)?
18.	___	___	___	Is there a system or plan to receive evidence of statistical control from primary suppliers?
19.	___	___	___	Is there a corrective action system designed around the SPC program?
20.	___	___	___	Are corrective action thresholds set and implemented?
21.	___	___	___	Is there evidence that this is being followed?
22.	___	___	___	Is necessary immediate corrective action suggested when the thresholds are exceeded?
23.	___	___	___	Is there a plan for evaluating and implementing SPC at supplier companies and is there evidence of its implementation?
24.	___	___	___	Is there a plan for evaluating and verifying SPC implementation?
25.	___	___	___	Does the measurement system evaluation plan provide for verification that the total measurement error is less than the specified measurement system objective? (This is typically less than ten percent of the product tolerance or process spread.)
26.	___	___	___	Does the SPC plan include data collection and analysis strategy?

	Yes	No	N/A	
27.	___	___	___	Are design of experiments and test verification integrated into SPC program?
28.	___	___	___	Are these provisions for determining if test objectives have been met?
29.	___	___	___	Do the test plans on file have objectives clearly stated?
30.	___	___	___	Is there evidence that the data is being analyzed in accordance with the documented plan?
31.	___	___	___	Does the continual improvement plan include provisions for periodic reconfirmation of process capabilities?
32.	___	___	___	Is there evidence of measuring performance to process capability goals?

Comments:

18 WET AND DRY LABORATORY PROCEDURES

Here is a questionaire for wet and dry laboratory procedures.

18.1 WET LABORATORY PROCEDURE

	Yes	No	N/A	
				Is there a current, written, and approved procedure that is revision controlled and on location for:
1.	___	___	___	Chemical bath analysis?
2.	___	___	___	Frequency of analysis?
3.	___	___	___	Method of sampling?
4.				Who takes samples? _____
5.	___	___	___	Are analysis results logged?
6.	___	___	___	Do logs allow for complete traceability of product?
7.	___	___	___	Is there a feedback loop to show that a chemical addition has been made?
8.	___	___	___	Are chemical data sheets readily available? For example, Material Safety Data Sheets (MSDS)
9.	___	___	___	Does the laboratory have a good safety record?

Comments:

18.2 DRY LABORATORY PROCEDURE

	Yes	No	N/A	
				Is there a current, written, and approved procedure that is revision controlled and on location for:
1.	___	___	___	Cross-section preparation method?
2.	___	___	___	Cross-section analysis?
3.	___	___	___	Frequency of analysis?
				Are results logged:
4.	___	___	___	On a process sheet or traveler?
5.	___	___	___	In a lab notebook?
6.	___	___	___	Is there complete traceability to the lot?
7.	___	___	___	Are lots put on hold awaiting lab results?
8.	___	___	___	Are plating specifications readily available and used?
				Are the following checked in the dry laboratory:
9.	___	___	___	Electroless copper deposition thickness?
10.	___	___	___	Electrolytic copper thickness?
11.	___	___	___	Electrolytic tin-lead thickness?
12.	___	___	___	Dielectric thickness?
13.	___	___	___	Gold thickness?
14.	___	___	___	Nickel thickness?
15.	___	___	___	Hot air solder level (HASL) thickness?
16.	___	___	___	Plating quality? Voids?
17.	___	___	___	Drill quality?
18.	___	___	___	Chemical etchback (Positive/negative etchback measurements)?
19.	___	___	___	Resin smear?
20.	___	___	___	Electroless separation?
21.	___	___	___	Layer registration?
22.	___	___	___	Foil cracks?
23.	___	___	___	Tg, delta Tg (3 degrees C maximum)?
24.	___	___	___	Delamination?
25.	___	___	___	Soldermask cure?
26.	___	___	___	Foil thickness?
27.	___	___	___	Pink ring?
28.	___	___	___	Is there a standardize checklist or form?

Comments:

19 WASTE TREATMENT SYSTEM

	Yes	No	N/A	
1.	___	___	___	Is there waste water treatment?
2.				How old is the current waste treatment facility?
				_____
3.				Who are the Governing Regulatory Agency Contacts?
				Federal/National: _____
				State/Province: _____
				Local: _____
4.				What waste treatment permits are required?
				_____
5.				What waste treatment permits are available?
				_____
6.	___	___	___	Are monitoring records for waste kept?
7.	___	___	___	Do the records show compliance with all environmental requirements?
8.	___	___	___	Has the baseline monitoring report been submitted?
9.	___	___	___	Is there a written procedure on the operation of the facility?
10.	___	___	___	Is there a written procedure on pollution alert and notification to the appropriate regulatory agency?
11.	___	___	___	Have previous violations been properly communicated to the appropriate regulatory agency?
12.	___	___	___	Is there formal waste treatment operator training?
13.	___	___	___	Are operators licensed? If yes, name the type of license.
				_____
14.				Who is responsible for waste treatment?
				_____
15.	___	___	___	Is there a written and approved closure plan for the board shop? Is one required by local regulations?
16.	___	___	___	Are there any regulatory agency orders pending?
17.	___	___	___	Are water backflow preventers used?
18.	___	___	___	Are hazardous wastes produced?
19.				Where are they dumped?
				_____
20.	___	___	___	Are there future plans for waste treatment improvements?
21.				What are they?
				_____
				_____

Comments:

20 MANUFACTURING PROCESS DOCUMENTATION

	Yes	No	N/A	
1.	___	___	___	Are current, written, and approved procedures that are under revision control available for all manufacture, inspection, test, and audit operations?
2.	___	___	___	Are these procedures on location and are they being used?
3.	___	___	___	Are current Digital standards and other specifications available to personnel, in the prevalent language, where needed?
4.	___	___	___	Are all process sheets and procedures documented and updated in accordance with a system that includes revision level control?
5.	___	___	___	Does Quality, Engineering, and Manufacturing approve all major changes to the process prior to implementation?
6.	___	___	___	Is there any evidence that procedures are followed by the personnel involved?
7.	___	___	___	Does a random sample of floor documents show that revisions match those in the master file?
8.	___	___	___	Is process documentation available to personnel in the prevalent language?
9.	___	___	___	Do procedures and process sheets reflect the tools, equipment, and methods that are actually in use in the area?
10.	___	___	___	If engineering drawings or specifications are required, are the latest revisions available at the work or inspection station?
11.	___	___	___	Is there operator traceability for each process?
12.	___	___	___	Is a Digital Supplier Engineer notified on critical process changes?
13.	___	___	___	Is there a current written procedure that outlines or performs the evaluation requirements and responsibilities for origination, revision, and distribution of quality, manufacturing, and engineering documents; for general procedures, forms, and checklists; and for visual aids?
14.	___	___	___	Does the procedure outline requirements and restrictions for maintenance and removal of out-of-revision documents from the process locations?
15.	___	___	___	Is there evidence that this procedure is being followed?
16.	___	___	___	Is there evidence that applicable documents are available at inspection points at the correct time in the manufacturing cycle?
17.	___	___	___	Are the current location and revision levels of all original releases documented and controlled by log?
				Have authorized approval signatures been defined for:
18.	___	___	___	Original releases?
19.	___	___	___	Temporary revisions?
20.	___	___	___	Final revisions to original releases?
21.	___	___	___	Is the procedure for revising documents, forms, procedures, and process sheets defined and followed?
				Are responsibilities defined for:
22.	___	___	___	Distributing new and revised documents?
23.	___	___	___	Training people to use new and revised documents?
24.	___	___	___	Monitoring that temporary documents are finalized on schedule?
25.	___	___	___	Removing obsolete documents?
26.	___	___	___	Are documents reviewed on a regular basis according to a documented procedure?
27.	___	___	___	Is there evidence that obsolete documents are removed promptly from points of issue and use?

	Yes	No	N/A	
28.	___	___	___	Does the document control center (responsible person) have copies of applicable Digital standards and engineering specifications?
29.	___	___	___	Are revisions to Digital standards and specifications communicated to the floor as appropriate?
30.	___	___	___	Are these revisions incorporated into plant documentation as appropriate?
31.	___	___	___	Are all procedures and changes to procedures signed off by production, test, engineering, quality managers, production, and the supervisor of the area where the procedure is used?

Comments:

21 MATERIAL IDENTIFICATION, TRACEABILITY OF ITEMS, STAMP CONTROL

	Yes	No	N/A	
1.	___	___	___	Is there a written, approved procedure under revision control, in use, and on location that outlines requirements for controlling identification and traceability of items?
2.	___	___	___	By piece and lot?
3.	___	___	___	Is lot control maintained throughout the entire process?
4.	___	___	___	Is there a documented, approved split-lot procedure?
5.	___	___	___	Does it provide for complete traceability?
6.	___	___	___	Is there a rework procedure that ensures parts rejoining the master lot?
7.	___	___	___	Is there traceability of items at all times throughout all processes, tests, and inspections?
8.	___	___	___	Does it allow for easy information retrieval?
9.	___	___	___	Is there a system that allows for total recall of all products?
10.	___	___	___	Is lot or part number identification recorded on process, inspection, and test records (as applicable)?
11.	___	___	___	Is the process, test, and inspection status of parts known or identifiable throughout all phases of the process?
12.	___	___	___	Does each lot show proof of completion of all process steps by means of a traveler, stamp, or software data collection system?
13.	___	___	___	Does it include identification of all material used?
14.	___	___	___	Are all items in bins, trays, racks, and skids identifiable as to description and part number?
15.	___	___	___	All products identified to show conformance, nonconformance and rework status?
16.	___	___	___	Is there a current, approved procedure under revision control and on location that defines the system for administrative control and record keeping of all stamps?
17.	___	___	___	Is there evidence that control of stamps is maintained during personnel turnover and transfer?
18.	___	___	___	Is there evidence that returned stamps are held for a specified period prior to re-issue?
19.	___	___	___	Is stamp control included in the in-process audit procedure?

Comments:

22 MATERIAL HANDLING AND STORAGE, STOCKROOM CONTROL

	Yes	No	N/A	
1.	___	___	___	Is there a current written, approved, and revision-controlled procedure that defines requirements for receipt, handling, storage, issue, and shipment of material?
2.	___	___	___	Is it on location and being followed?
3.	___	___	___	Is there a training program for stockroom personnel?
4.	___	___	___	Are all containers properly identified and labeled with part number, date, and acceptance stickers?
5.	___	___	___	Is there a method for ensuring that proper and sufficient materials are stocked for future builds?
6.	___	___	___	Are dated materials (chemicals, prepreg, film) inspected for shelf-life expiration?
7.	___	___	___	Are temperature, humidity, and light-sensitive materials properly stored?
8.	___	___	___	Are items protected at all times to prevent damage?
9.	___	___	___	Is there a system for purging obsolete, out-of-revision, and out-of-date material?
10.	___	___	___	Is the stockroom's material locator system effective?
11.	___	___	___	Are special handling tools and equipment maintained and calibrated?
12.	___	___	___	Is nonconforming and rejected material identified and segregated to prevent its receipt into the stockroom?
13.	___	___	___	Are good housekeeping, handling, and storage practices in evidence?

Comments:

23 PACKAGING AND SHIPPING

	Yes	No	N/A	
1.	___	___	___	Are current, written, approved, and revision-controlled operating procedures and specifications for packaging, cleaning, and sealing available and in use?
2.	___	___	___	Do they include specifications for clean, dry, sulfur-free packaging materials for protection between boards and bundle outer covering?
3.	___	___	___	Do these procedures specify ventilation for thermosealed coverings to eliminate trapped gases?
4.	___	___	___	Is Digital's packaging and labeling procedure available and in use?
5.	___	___	___	Is there evidence that it is followed?
6.	___	___	___	Are adequate storage facilities available and in use to safeguard the quality of the product between final acceptance and shipping?
7.	___	___	___	Are accepted boards protected from soiling, damage, and contamination while awaiting packaging?
8.	___	___	___	Is protective packaging used?
9.	___	___	___	If applicable, is there inspection for packing slips, stickers, and other paperwork prior to sealing the container?
10.	___	___	___	Are shipping labels stored to ensure proper identification and prevent mix-ups?
11.	___	___	___	Are markings and labels applied to containers so as to remain legible and fixed during, storage, handling, and distribution?
12.	___	___	___	Is a packaging inspection (audit) performed to ensure compliance with packaging instructions?
13.	___	___	___	Do markings and labels accurately reflect the contents of the container, and are they accurately placed and signed?
14.	___	___	___	Are skids properly loaded and their loads properly strapped or confined?
15.	___	___	___	Are packaging damage reports issued for interplant and intraplant shipments?
16.	___	___	___	Is good housekeeping in evidence in the area?
17.	___	___	___	Are health and safety regulations complied with (such as eye protection, ventilation and so forth)?
18.	___	___	___	Can the product be traced to its customer in the event of a recall?

Comments:

24 CALIBRATION CONTROL AND MAINTENANCE

	Yes	No	N/A	
1.	___	___	___	Is there a current, documented, and approved procedure defining the administration, operation, and recordkeeping systems of the plant calibration system?
2.	___	___	___	Is this procedure under revision control, on location, and being used?
3.	___	___	___	Is there evidence that all test and measuring tools and equipment receive scheduled calibration and preventive maintenance, if applicable?
4.	___	___	___	Is a recall system maintained with a list of equipment due for calibration and maintenance?
5.	___	___	___	Is it provided to each supervisor regularly?
6.	___	___	___	Are the manufacturer's supplied calibration and maintenance procedures and schedules used to develop the approved maintenance and calibration schedules and procedures?
7.	___	___	___	Does manufacturing, quality, and maintenance all approve on the calibration and maintenance procedures and schedules?
8.	___	___	___	Is there evidence of overdue calibration or maintenance?
9.	___	___	___	Are calibration and maintenance records maintained, complete, and available for review?
10.	___	___	___	Are calibration results reviewed to verify the adequacy of calibration intervals?
				Are all reference standards:
11.	___	___	___	Traceable to a nationally-recognized bureau of standards?
12.	___	___	___	Maintained in calibration?
13.	___	___	___	Are controls and capability documented for calibration and maintenance services obtained from outside agencies?
14.	___	___	___	Is backup (spare) equipment available for use during periods of calibration?
15.	___	___	___	Is uncalibrated equipment indicated as such and removed from use?

Comments:

25 PURCHASING

	Yes	No	N/A	
1.	___	___	___	Has the company or facility defined in the quality plan its requirements for support from Purchasing?
2.	___	___	___	Has Purchasing indicated agreement by signing the quality plan?
3.	___	___	___	Is there a current, written, approved, and revision-controlled procedure on location that outlines the requirements for control of Purchasing?
4.	___	___	___	Is the procedure being followed?
5.	___	___	___	Are suppliers evaluated and selected based on their ability to meet quality, price, and delivery requirements?
6.	___	___	___	Is there a current approved Qualified Vendor List (QVL)?
7.	___	___	___	Is there evidence that evaluations are performed on all suppliers before the first order is placed?
8.	___	___	___	Is quality surveillance performed with purchasing support at the supplier's site?
				Does the purchase order contain or reference through the purchase specification the following requirements:
9.	___	___	___	Correct part number and revision level?
10.	___	___	___	Complete, clear descriptions of requirements, including Underwriters Laboratory (UL), Canadian Standards Association (CSA), and International Electro-mechanical Commission?
11.	___	___	___	Requirements for approval of qualifications of items, processes, or operations?
12.	___	___	___	Part identification requirements?
13.	___	___	___	Container identification requirements, including revision level?
14.	___	___	___	Packaging, preservation, and shipping requirements?
15.	___	___	___	Requirements for objective quality data, where applicable?
16.	___	___	___	Is Purchasing part of the communication loop through which suppliers receive ECO revision level updates?
17.	___	___	___	Does purchasing use Vendor Corrective Action Requests (VCARs) in conjunction with Quality and Engineering?
				Is there evidence that Purchasing resolves:
18.	___	___	___	Recurring problems with purchased parts?
19.	___	___	___	The timely disposition of Return to Vendor (RTV) material?
20.	___	___	___	Problems of inadequate packaging material?
				Issuance regular supplier reports for:
21.	___	___	___	Supplier delivery performance?
22.	___	___	___	Quality performance?
23.	___	___	___	Corrective action?
24.	___	___	___	Do revision levels on Purchasing records match those recorded in the master documentation file?

Comments:

26 SUBCONTRACTOR CONTROL

	Yes	No	N/A	
1.	___	___	___	Does the plant or business have a general subcontracting plan that is documented and approved?
2.	___	___	___	Has Purchasing supported the plant or business in the design and implementation of a subcontracting plan?
3.	___	___	___	Are specific responsibilities and obligations of the subcontractor to the plant or business documented regarding materials assembly and test methods, workmanship standards, and quality levels?
4.	___	___	___	Is the Quality function in the approval loop for subcontractor approval?
				Are subcontractor surveys performed:
5.	___	___	___	According to an approved procedure?
6.	___	___	___	On a scheduled basis?
7.	___	___	___	With records to substantiate results?
8.	___	___	___	Is there a subcontractor rating system within the plant/business?
9.	___	___	___	Is the quality function involved in approving the package (documentation, visual aids, tooling, materials, revisions) that the subcontractor requires to perform the job?
10.	___	___	___	When the job is subcontracted, are there controls in place to ensure that materials and processes meet safety and QVL requirements?
11.	___	___	___	Is the incoming quality level for subcontractor material controlled either by supplier inspection or incoming inspection?
12.	___	___	___	Is there traceability to the subcontractor throughout their process and their suppliers?

Comments:

Operations subcontracted_____

Number of Contractors_____

27 SKILLS TRAINING AND QUALIFICATION

	Yes	No	N/A	
1.	___	___	___	Is there a written procedure for skills assessment or training program (formal or on the job training (OJT)) that must be passed before a person is placed in a position?
2.	___	___	___	Is there a master list of operations or equipment qualified operators that is available to supervisors and managers at all times?
3.	___	___	___	Is there evidence of adherance to this procedure?
4.	___	___	___	Is there training on a product's manufacturing processes before the product is put into production?
5.	___	___	___	Is there an individual who is responsible for evaluating the training program?
6.	___	___	___	Are there operator training programs for continuous improvement?
7.	___	___	___	What formal training programs is the manufacturer using?

Comments:

28 PRODUCT SAFETY

	Yes	No	N/A	
1.	___	___	___	Is there a current, approved, and documented company or facility product safety plan?
2.	___	___	___	Is there a Product Safety Coordinator charged with administration of the product safety plan?
3.	___	___	___	Are the current UL regulatory standards and documents available?
4.	___	___	___	Do purchase orders and specifications reflect UL requirements directly and or by reference to a purchase specification?
5.	___	___	___	Does supplier supplied material comply with required UL marking, labeling, and flammability testing?
6.	___	___	___	Are flammability test records and procedures available in incoming inspection?
				Are records and reports of UL and CSA audits and inspections available for review of:
7.	___	___	___	Corrective action taken?
8.	___	___	___	Follow-up and sign-off?
9.	___	___	___	Is there a proper record retention system?
				Is there a procedure for reviewing or communicating product safety concerns about:
10.	___	___	___	New products?
11.	___	___	___	New processes?
12.	___	___	___	Product safety incidents?
13.	___	___	___	Regulatory compliance issues?
14.	___	___	___	Are currently produced products or processes covered by UL follow-up procedures?
15.	___	___	___	Does the supplier's UL pattern recognitions and ratings cover the technology sourced at the location?
16.	___	___	___	Does raw material in the stockroom comply with UL follow-up procedures?
17.	___	___	___	Is supplier material checked for UL status?
18.	___	___	___	In accordance with the product safety plan, does the plant or business Product Safety Coordinator audit this system to ensure that Purchasing, Incoming Inspection, Engineering, Quality Control, Records Management, and others are complying with their responsibilities regarding product safety?

Comments:

29 EMPLOYEE SAFETY PRACTICES

	Yes	No	N/A	
1.	___	___	___	Is there a company or facility Health and Safety Engineer charged with administering worker safety programs?
				Is there a current, documented, and approved Employee Health and Safety plan that addresses:
2.	___	___	___	Eye protection requirements and marking?
3.	___	___	___	Toxic fumes protection and marking?
4.	___	___	___	Trip hazard protection and marking?
5.	___	___	___	High voltage area protection and marking?
6.	___	___	___	Other hazardous equipment, processes, and materials?
7.	___	___	___	Safety training program for both management and employees?
8.	___	___	___	Are there periodic refresher requirements?
9.	___	___	___	Demonstration of the emergency evacuation?
10.	___	___	___	Posting of emergency phone numbers?
11.	___	___	___	Are there scheduled audits of the entire plant or business conducted by the Health and Safety Engineer?
12.	___	___	___	Are areas requiring special safety precautions clearly marked?
13.	___	___	___	Are eye protection areas clearly marked?
14.	___	___	___	Do people working in these areas wear safety glasses?
15.	___	___	___	Are visitors required to wear glasses?
16.	___	___	___	Are areas around solder machines and plating tanks properly ventilated?
17.	___	___	___	Is the floor area free from trip hazards?
18.	___	___	___	Are work areas free from obvious mechanical and electrical hazards?
19.	___	___	___	Does the plan include safety training programs for employees and management?
20.	___	___	___	Are all hazardous, toxic material areas, and process equipment clearly marked?
21.	___	___	___	Is there an emergency evacuation process?
22.	___	___	___	Are all employees familiar with this process?
23.	___	___	___	Are all emergency exits and eye wash stations clearly marked?
24.	___	___	___	Is there an internal control process for ensured compliance to the plan?
25.	___	___	___	Is there a plant or business safety committee with management and employee representation?
				If Yes, does it:
26.	___	___	___	Conduct accident investigations?
27.	___	___	___	Conduct regular safety tours?
28.	___	___	___	Prepare reports, maintain records?
29.	___	___	___	Ensure action, follow-up, and approval on reports and safety regulations?
30.	___	___	___	Engage in accident prevention?
31.	___	___	___	Are safety records available?
32.	___	___	___	Are safety records complete?
33.	___	___	___	Do the records cause concern due to number or severity of accidents?
34.	___	___	___	Is there a copy of minimum Occupational Safety and Health Act (OSHA) standards or local regulatory agency equivalent?

	Yes	No	N/A	
35.	___	___	___	Were there any safety or health concerns noted during audit? For example, housekeeping, fumes, noise, material handling practices, protective equipment not worn, hazardous equipment or processes?
36.	___	___	___	Are there any areas not in compliance with the local regulatory agency's minimum standards?

Comments:

APPENDIX A REFERENCED DOCUMENTS

A.1 Digital Documents, EL-Class

Document Number	Document Title
EL-00017-00	*DEC STD 017-0 Quality Assurance System Requirements*
EL-00088-00	*DEC STD 088-0 Qualification Procedure for All Printed-Wiring Board Suppliers*
EL-00176-00	*DEC STD 176-0 Printed-Wiring Board Acceptance Criteria*
EL-00176-01	*DEC STD 176-1 Printed-Wiring Board Repair Criteria*
EL-00176-02	*DEC STD 176-2 Printed-Wiring Board Product Safety Criteria*

Use VTX SMC to order copies of EL-class documents from Standard and Methods Control. Send distribution questions to JOKUR::SMC or call DTN:234-4423.

A.2 Documents External to Digital

Document Number	Document Title
IPC-PC-90	*General Requirement for Implementation of Statistical Process Control*
MIL STD 105D	*Single Sampling, Normal at an AQL of 0.65%*

A.3 Ordering Information

Following are the sources for documents not available from Standards and Methods Control.

- Military standards and specifications
  Naval Publications and Forms Center
  5801 Tabor Avenue
  Philadelphia, PA 19120
- IPC (Institute of Printed Circuits) Publications
  The Institute for Interconnecting and Packaging Electronic Circuits
  7380 N. Lincoln Ave
  Lincolnwood, IL 60646
  Telephone (708) 677-2850

APPENDIX B RELATED DOCUMENTS

B.1 Documents External to Digital

Document Number	Document Title
ECMA-1XX	*Safety of Information Technology Equipment*

B.2 Ordering Information

Following are the sources for documents not available from Standards and Methods Control.

- ANSI, IEC, and ISO Documents
  American National Standards Institute (ANSI)
  1430 Broadway
  New York, NY 10018
  Telephone (212) 354-3300 x479

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